TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1950

No. 565

RADIO CORPORATION OF AMERICA, NATIONAL BROADCASTING COMPANY, INC., RCA-VICTOR DISTRIBUTING CORPORATION, ET AL., APPELLANTS,

vs.

THE UNITED STATES OF AMERICA, FEDERAL COMMUNICATIONS COMMISSION AND COLUMBIA BROADCASTING SYSTEM, INC.

APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

FILED FEBRUARY 19, 1951.

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INDEX

JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., MAR. 6, 1951.

[fols. 1-4] [Captions omitted]

[fol. 5]

IN THE UNITED STATES DISTRICT COURT, NORTHERN DISTRICT OF ILLINOIS, EASTERN DIVISION

RADIO CORPORATION OF AMERICA, NATIONAL BROADCASTING COMPANY, INC.

and

RCA VICTOR DISTRIBUTING CORPORATION, Plaintiffs,

against

UNITED STATES OF AMERICA and FEDERAL COMMUNICATIONS COMMISSION, Defendants

Equitable Relief Sought

Civil Action No. 50C1459

COMPLAINT—Filed October 17, 1950

Plaintiffs, for their complaint herein, allege:

Jurisdiction

1. Plaintiffs, above named, bring this action pursuant to the provisions of the Communications Act of 1934, as amended (48 Stat. 1064, 1093 and 63 Stat. 108; 47 U. S. C. Section 402 (a)) and of Title 28 United States Code (28 U. S. C. Sections 1336, 1398, 2284, 2321-25) and Section 10 of the Administrative Procedure Act (60 Stat. 243; 5 U. S. C. Section 1009), to enjoin, set aside, annul and suspend an [fol. 6] order of the Federal Communications Commission (hereinafter called the "Commission") adopted October 10, 1950 in proceedings entitled "In the Matters of Amendment of Section 3.606 of the Commission's Rules and Regulations (Docket Numbers 8736 and 8975), Amendment of the Commission's Rules, Regulations and Engineering Standards concerning the Television Broadcast Service (Docket Number 9175) and Utilization of Frequencies in the Band 470 to 890 Mcs. for Television Broadcasting (Docket Number 8976)", (the order being hereinafter called the "Order"). The effective date of the Order is November 20, 1950.

The Parties

2. Plaintiff Radio Corporation of America (hereinafter called "RCA"), is a corporation duly organized and existing under the laws of the State of Delaware, and resides in the Northern District of Illinois, Eastern Division, being qualified to do business and doing business in said District and Division.

3. Plaintiff, National Broadcasting Company, Inc. (hereinafter called "NBC"), is a corporation duly organized and existing under the laws of the State of Delaware, and resides in the Northern District of Illinois, Eastern Division, being qualified to do business and doing business in said District and Division. NBC is a wholly owned subsidary of RCA.

4. Plaintiff, RCA Victor Distributing Corporation (hereinafter called the "Distributing Corporation") is a corporation duly organized and existing under the laws of the [fol. 7] State of Illinois, and resides in the Northern District of Illinois, Eastern Division, having its principal office at 666 North Lake Shore Drive, Chicago, Illinois. The Distributing Corporation is a wholly owned subsidiary of RCA.

5. The Commission is an administrative tribunal created by said Communications Act of 1934 and is charged with the execution and enforcement of said Act.

6. The United States of America is made a defendant in this suit pursuant to the provisions of the Act of June 25, 1948 (62 Stat. 969; 28 U. S. C. Section 2322), and said Communications Act of 1934 (48 Stat. 1064, 1093, and 63 Stat. 108; 47 U. S. C. Section 402(a)).

The Industry Affected

7. RCA is engaged, among other things, in research and development work in the field of electronics and particularly in the field of radio and television, and in the manufacture and sale of radio and television transmitting and receiving apparatus and tubes.

8. NBC is engaged in sound and television broadcasting and in sound and television network broadcasting in interstate and foreign commerce.

9. The Distributing Corporation is engaged in the sale of television receivers and other products manufactured by the RCA Victor Division, the manufacturing division

of RCA, to dealers located in Chicago and other midwestern cities.

[fol. 8] 10. Since the 1920's RCA has been engaged in television research and development work, both with respect to black and white television and with respect to color television.

11. RCA and NBC have a present investment in television of approximately $100,000,000.

12. The Commission established commercial standards covering the transmission and reception of black and white television programs in 1941.

13. As a result of World War II the commercial development of television on any substantial scale was delayed until the fall of 1946, when the commercial sale of television home receivers began.

14. Since the fall of 1946 RCA has manufactured and sold to the public over a million and a half television home receivers. The television receiving set industry has manufactured and sold an estimated total of more than 8,000,000 black and white television home receivers.

15. These 8,000,000 television receivers represent an estimated audience of over 30,000,000 people and an estimated investment on the part of the public of over two billion dollars.

16. There is a reciprocal relationship between the number of television receivers in the hands of the public (the television audience) and the service which the television broadcaster is able to render to the public. The broadcasting of television programs is supported by the sale of time to advertisers, and the value of such time (and the revenue [fol. 9] derived from the sale of such time) is dependent primarily upon the size of the audience which may be reached by the broadcaster.

17. At the outset of the commercial development of television in 1946 the number of receivers outstanding was insufficient to maintain the schedule of NBC television programs, except at a substantial financial loss. The schedule of television programs maintained by NBC at that time resulted in substantial financial loss. As the number of receivers increased, NBC's revenues increased, and NBC and other broadcasters were enabled to improve and expand their television broadcast service.

18. Since the fall of 1946 the number of television re-

ceiving sets in the hands of the public has steadily and rapdily increased. On January 1, 1947, an estimated 15,000 television receiving sets were in the hands of the public. On January 1, 1948, the number is estimated at 200,000; on January 1, 1949, at 1,000,000; on January 1, 1950, at 4,000,000; and as of October 1, 1950 it is estimated that more than 8,000,000 black and white television receiving sets were in the hands of the public.

19. As a result of this steady and rapid increase in the number of television receivers in the hands of the public there is now the prospect of a television audience sufficient to permit the broadcasting of television programs without financial loss.

20. NBC owns and, pursuant to licenses granted by the Commission, operates five television broadcast stations. In addition, NBC furnishes television network program service to 58 television broadcast stations. The television [fol. 10] broadcast operations of NBC represent an investment of more than $8,000,000. More than 2,400 employees of NBC are engaged in television broadcast activities, and NBC estimates that its television broadcast activities provide employment to more than 3,700 people who are not employees of NBC.

21. The real estate, plants and equipment owned by RCA and devoted to the manufacture of television transmitting and receiving apparatus and tubes represent an investment of more than $35,000,000. More than 28,000 employees of RCA are engaged in the manufacture, service and sale of television transmitting and receiving apparatus and tubes. RCA's gross sales of television transmitting and receiving apparatus and tubes is at the annual rate of over $400,000,000.

22. The total present investment of the television manufacturing industry is estimated at not less than $300,000,000. Its total annual gross sales are estimated at $1,500,000,000. The total investment of the television broadcasting industry is estimated at $50,000,000. Its total annual gross income from television operations is estimated at $325,000,000.

Existing Black and White Television Standards

23. Commercial television broadcasting in the United States is carried on under technical transmission standards which were established by the Commission in 1941 after

extensive hearings. Until the promulgation of the Order complained of, the technical television transmission standards (the Commission's "Rules, Regulations and Engineer-
[fol. 11] ing Standards Concerning the Television Broadcast Service") contemplated commercial television broadcasting in black and white only and provided for commercial television broadcasting in 12 channels each of which is 6 megacycles wide.

24. The technical standards set by the Commission are of great importance in determining the quality of the television broadcast service available to the public, for those standards set the upper limits of performance which may be achieved by television transmitting and receiving apparatus. The present black and white television system has met with widespread public acceptance. The high quality of the present television service has been a large factor in the success of the television industry described above.

25. The black and white television transmission standards provide for the broadcasting of a television picture which has 525 lines and 60 fields per second. The present black and white standards are such that the picture which appears on the face of the television receiver is comprised of approximately 200,000 picture elements. It is this large number of picture elements which accounts for the high degree of picture detail and the consequent picture quality produced.

26. The television transmitting and receiving equipment manufactured and sold by RCA and others has been designed in accordance with these standards. This equipment has been carefully designed in order to give to the public the best possible television service at the lowest possible cost.

[fol. 12] 27. The public acceptance of television based upon these standards has been unequalled in the history of any other industry or public service.

28. The enormous and rapidly increasing sale of television receivers would not have been possible without the concurrent initiation, development and growth of a television broadcast service which, in turn, has also depended upon the sale of receivers described above.

29. The initiation, development and growth of the television broadcasting and receiving industry would not have been possible were the standards set by the Commission

not of high quality and were they not adopted with the express view to protecting the public against obsolescence.

30. It is on this foundation that the entire television industry rests. The quality of the present service, the improvements and reductions in price to the public that have been made, the incredible expansion of the industry as a whole, are all due to the fact that manufacturers could build upon a single set of long-range high-quality standards.

This single set of long-range, high-quality standards has been arbitrarily and capriciously upset by the Order of the Commission herein complained of.

Proposed Color Television Systems

31. On July 11, 1949 the Commission issued a document entitled "Notice of Further Proposed Rule Making (FCC 49-948)" in the above described proceedings. A copy of [fol. 13] this Notice is attached hereto as Exhibit A and made a part hereof.

32. In this Notice the Commission proposed, among other things, to consider color television systems, provided that such color systems met two criteria: first, that they operate in a 6-megacycle channel and second, that the pictures could be received on existing television receivers "simply by making relatively minor modifications in such existing receivers."

33. Pursuant to this Notice and the various amendments thereto, a hearing was held before the Commission *en banc* commencing September 26, 1949 and continuing intermittently until May 26, 1950.

34. During the course of these hearings evidence was presented to the Commission with respect to three proposed color television systems, all of which can operate in a 6-megacycle channel. The three color systems were those proposed by RCA, by Color Television Incorporated and by Columbia Broadcasting System, Inc. (hereinafter called "CBS").

35. RCA presented evidence with respect to its all-electronic, high-definition color television system, which is completely compatible. Compatibility means that the color television transmissions of the system can be received as a black and white picture on an existing black and white

receiver without making any changes in the receiver whatever.

36. In addition, the color transmissions of the RCA system can be received on existing receivers as a black [fol. 14] and white picture without any degradation of the quality of the picture as compared with a standard black and white picture.

37. Color Television Incorporated also presented evidence with respect to an all-electronic and theoretically compatible system.

38. CBS presented evidence with respect to its color television system, which is wholly incompatible. This means that nothing whatsoever can be received by any of the existing 8,000,000 black and white receivers from broadcasts of the CBS color system.

39. Even after extensive and expensive adaptation, the only picture which can be received on existing receivers from CBS system transmissions is a degraded black and white picture. Instead of having 525 lines and 60 fields per second, as does the present black and white system, the CBS system has only 405 lines and 144 fields per second. The picture which appears on the face of the television receiver in the CBS system is comprised of only 83,000 picture elements as contrasted with the 200,000 picture elements of the standard black and white picture. This is a serious decrease in picture detail and picture quality.

40. The CBS system was designed for use with a spinning mechanical disc, which it still uses. The maximum direct view color picture which can be produced with a mechanical disc receiver is a 12½" picture. Over 99% of the television sets in the hands of the public are direct view receivers. Approximately 90% of the receivers sold at the present time are sets with a picture of 16 inches or larger.

[fol. 15] 41. After the adaptation above referred to, by purchasing and installing an additional expensive device called a converter it is possible for some existing receivers to obtain CBS transmissions in color. However, when this device is used there is a loss of picture size if the picture tube is larger than 12½ inches. This converter consists primarily of the spinning mechanical disc and its housing. Whenever a black and white program is on the air this converter has to be removed, to be replaced again when a color transmission is to be received.

The Commission's First Report

42. On September 1, 1950, the Commission issued a document in these proceedings entitled "First Report of Commission (Color Television Issues)", a copy of which is annexed hereto as Exhibit B and made a part hereof, together with its "Second Notice of Further Proposed Rule Making", a copy of which is annexed hereto as Exhibit C and made a part hereof.

43. In this Report the Commission did not adopt any of the proposed color television systems. The Report concluded instead that the Commission should allow more time for the development of all color systems. The Commission, however, conditioned the allowance of this additional time upon the acceptance by the industry of two arbitrary conditions.

44. Although the Commission has no jurisdiction over television set manufacturers, the Commission sought to require that such manufacturers agree with the Commission to build all their black and white television receivers according to specifications laid down by the Commission. [fol. 16] These specifications required extensive alterations in present production model receivers.

45. The Commission stated to the television set manufacturers that if they did not agree so to build their sets the Commission would forthwith and finally adopt the CBS color system.

46. To implement its arbitrary conditions the Commission proposed the adoption of so-called bracket standards. These would permit the broadcasting and reception of black and white television of either 525 lines, 60 fields per second, or 405 lines, 144 fields per second, or any other combination of lines and fields within widely separated limits.

47. The Commission's notice instituting this hearing made no mention of bracket standards. As one Commissioner stated: "The subject of bracket standards was not at issue in the hearing nor was the subject even advanced during the hearing. * * * the subject of bracket standards was a new concept in field and line scanning proposed after the hearing record closed. It came as a surprise to industry and was not based upon information appearing in the record of this proceeding."

48. The other arbitrary condition required by the Com-

mission was acquiescence by the industry in this drastic change, without a hearing, in the black and white standards which had been in effect since 1941.

49. The additional complexity of bracket standards receivers, at the rate of production which existed before the issuance of the Order complained of, would have resulted [fol. 17] in an increased cost to the public for television receivers of hundreds of millions of dollars each year. These hundreds of millions would not have provided color pictures but would only have provided for variations in the standards of black and white transmissions.

50. These hundreds of millions of dollars each year would be spent by the public in order to provide a degraded compatibility for the CBS system in the event the Commission decided, after obtaining further information with respect to all of the systems proposed, to adopt the CBS system. In addition, this degraded compatibility could be obtained only on future receivers.

51. The Commission's First Report shows that the Commission was not satisfied with the CBS system. There are many instances in which the Commission stated that it desired more information with respect to defects of the CBS system and the Commission's description of the CBS system is in terms of adequacy rather than in terms of high-quality performance. Yet the Commission's Report threatened to adopt the CBS system on what the Commission itself characterized as "speculation and hope", unless the television manufacturing industry would accept dictation by the Commission as to the kind of receiver which it must build in the future.

52. With minor exceptions, those of the television manufacturing industry who submitted comments with respect to said Second Notice stated that to change their production of black and white receivers so as to accept the proposed standards was impractical, unnecessarily costly to the public, and could not be done in accordance with the time schedule set forth in the Second Notice. A copy of [fol. 18] the RCA Comments with respect to the Second Notice is annexed hereto as Exhibit D and made a part hereof.

53. These comments pointed out the facts that the Commission's proposal to adopt the CBS system was based on scientifically incorrect conclusions, was at variance with the evidence submitted at the hearings, and was contrary

to the public interest, convenience and necessity. In addition, the comments directed the Commission's attention to certain readily available information of controlling significance which the Commission failed to consider although it had the duty to do so before reaching a final decision. This is particularly true in view of the fact that the Commission's Report showed that it did not understand various aspects of the RCA system.

The RCA Petition

54. On October 4, 1950, RCA filed a Petition with the Commission asking for additional time in which the Commission might view the improvements in performance of the RCA color system, without insisting upon the two limiting arbitrary conditions hereinabove referred to. A copy of this Petition is annexed hereto as Exhibit E and made a part hereof.

55. On October 10, 1950 the Commission denied the RCA Petition and issued the Second Report of the Commission. A copy of the Order denying the Petition is annexed hereto as Exhibit F and made a part hereof, and a copy of the Second Report is annexed hereto as Exhibit G and made a part hereof. The Second Report reserved the question of bracket standards for future hearing.

[fol. 19] 56. In its Second Report the Commission reaffirmed its First Report, and concluded, without looking at them, that no improvement in existing systems warranted a reopening of the record.

The Order of the Commission

57. Without further hearings, and pursuant to its First and Second Reports, the Commission on October 10, 1950 issued its Order effective November 20, 1950 adopting the incompatible CBS color television system for the commercial broadcasting of color television. A copy of the Order is annexed hereto as Exhibit H and made a part hereof.

58. The effect of the Order will be that all existing television receivers will be unable to receive a part of the television broadcasting service. Programs transmitted pursuant to the standards promulgated by the Order will not be receivable on existing sets even as black and white programs unless the sets are extensively modified at considerable cost, and even then the black and white picture

produced by the CBS standards will be degraded in quality.

59. Programs transmitted pursuant to the CBS standards will not be receivable on existing sets as color programs unless the sets are even more extensively modified at greater cost, and in many instances the modifications proposed are impractical.

60. New sets designed to receive the CBS standards, as well as existing standards, in black and white, will take time to produce and will be substantially more expensive than existing sets.

[fol. 20] 61. New sets designed to receive the CBS standards in color will also take time to produce and will be even more expensive.

62. The broadcaster of television programs will have virtually no audience at all for programs transmitted in accordance with the CBS standards, neither a black and white audience nor a color audience, for a considerable period of time, if ever.

63. To the extent that programs are broadcast pursuant to the CBS standards, existing television set owners will be deprived of a part of the television broadcast service, in reliance on which they purchased their sets.

64. The broadcasting of television programs on the CBS standards will deprive broadcasters of the television audience that has been gradually built up over a period of four years, to the irreparable injury of the television broadcast service, and will deprive the existing television audience of a part of the television broadcast service, to the irreparable injury of the public interest.

65. The reciprocal relationship between the television receivers in the hands of the public and the service which the television broadcaster is able to render to the public, upon which the entire television industry depends, will be upset as a result of the Order. The broadcaster will be unable to count upon the audience which he has thus far been entitled to expect, and the television set owner will be unable to count on the continuance of the television broadcast service which he has been led to believe he would receive.

[fol. 21] 66. The effect of the Order will be to impair the existing market acceptance of the present black and white television receivers, to the irreparable injury of the television receiver manufacturing and distributing industry.

67. The effect of the Order is to authorize the commer-

cial broadcasting of color programs upon CBS standards to the exclusion of the commercial broadcasting of color programs on any other color television standards. Thus, commercial broadcasting in accordance with the RCA system is prohibited, although it, unlike the CBS system, is compatible and can be received on existing receivers without modification and without degradation of picture quality, and can be broadcast by all television broadcasters without dilution of their audience.

68. The public's loss of television service and the broadcaster's loss of television audience because of the incompatibility of the CBS system cannot be solved by simultaneous transmissions on color and on black and white standards. This would require that every broadcaster use two broadcasting channels rather than one. The demands of the various radio services for channel space in the radio frequency spectrum are so great as to prevent such duplicate transmissions.

69. Ten years having elapsed since the adoption of commercial television standards during which the public has invested approximately two billion dollars in television receivers, the Commission cannot consistently with its obligation to protect the public interest adopt a color system which is incompatible with the black and white system on which more than 30,000,000 of the public depend for their television service.

[fol. 22] *The Order Cannot Be Sustained*

70. The Commission's staff engineer who took the most active role throughout the hearing on behalf of the Commission's technical staff and who is in charge of the Commission's laboratory which tested the various color systems invented a device usable only in the CBS system and applied for a patent thereon.

71. On disclosure of this fact objection by RCA was overruled and the staff engineer continued in the proceedings as theretofore.

72. On information and belief the Commission relied on this staff engineer's advice because the majority of the Commission have no engineering training and the decision of the Commission is stated to be based entirely upon engineering considerations.

73. Although the engineer foreswore any financial interest in his device he did have professional prestige and

reputation at stake which could be furthered only if the CBS system were adopted.

74. On information and belief he advised the Commission in the absence of the parties and participated in the formulation and preparation of its Reports and the Order herein complained of.

75. The Commission's Order is illegal, void and beyond the power, authority and jurisdiction of the Commission for the following reasons:

(a) The Order is contrary to the public interest, convenience and necessity, the basic statutory standard contained in the Communications Act of 1934.

[fol. 23] (b) The Order violates Section 303(g) of the Communications Act of 1934.

(c) The Order is unsupported by substantial evidence, is arbitrary and capricious, and is an abuse of discretion.

(d) The Order was adopted before the Commission had discharged its statutory duty to inform itself adequately before issuing a final order in a rule-making proceeding. The Commission wrongfully refused to consider additional evidence of determinative significance to its decision and wrongfully denied the RCA Petition.

(e) The Order is based upon the rejection by the television industry of the two illegal conditions set forth in the First Report.

(f) The Order is contrary to the terms of the Commission's Notice of July 11, 1949, pursuant to which the hearings on which the Order purports to be based were held.

(g) On the facts disclosed, the staff engineer should not have been permitted to continue in the proceeding.

(h) The Order deprives the plaintiffs of property without due process of law, contrary to the Fifth Amendment to the Constitution of the United States.

[fol. 24] *Plaintiffs Will Be Irreparably Injured by the Order*

76. The Order complained of will irreparably injure RCA's television manufacturing business by decreasing the sale of television receivers. The promulgation of this order, involving an abrupt departure from the long range stand-

ards adopted in 1941, jeopardizes the long term enjoyment of a television set purchased today. The uncertainty thus engendered is heightened by the overhanging threat of a still further change in standards. This threat is real because of the Commission's statement that it will hold a hearing on the possible adoption of bracket standards on a basis that no one can predict.

77. Doctor Frank Stanton, President of CBS, on October 15, 1950, went on the air over that network to discourage people from buying present models of television receivers.

78. RCA is now in the process of manufacturing and marketing present black and white receivers which will have an aggregate retail market value of more than $10,000,000 when completed. In addition, RCA has an inventory and has contracted for the purchase of parts and components for such black and white receivers in the aggregate amount of $55,000,000. The demoralization of the market resulting from the Order will seriously impair RCA's opportunities for selling these receivers.

79. The Distributing Corporation has a present inventory of television receivers costing approximately $1,000,000, with respect to which it does not have firm sales contracts. The effect of the Order will to be to injure the [fol. 25] Distributing Corporation in the sale of this inventory and will otherwise damage its business of selling black and white television receivers.

80. NBC has a present investment of more than $8,000,000 in its television network facilities and television stations. While this investment was made in the hope of eventually earning a profit on these activities, it was recognized that earnings could not be achieved in the early years when there were insufficient receivers in the hands of the public. As a result, NBC has suffered a cumulative loss of many millions of dollars from its television broadcasting and programming operations to date, and was just beginning to reach a point where some of these losses could be recouped when the Commission announced its Order of October 10, 1950 on color television. The effect of the Order will be either substantially to dilute the television audience, on the reasonable expectation of which NBC has made substantial financial investments and commitments, or to require NBC to commence incompatible color broadcasting to a virtually non-existent color audience, or both, each

of which will irreparably injure NBC's television broadcasting business.

81. RCA has a large investment in the development of its compatible color television system. The Order adopting the incompatible CBS color system impairs the advantages of compatibility now possessed by the RCA system. If the Order standardizing upon the CBS color system remains in effect and receivers capable of operating on those standards are sold, the existence of those receivers in the hands of the public will operate as a deterrent to the adoption of the RCA system by the Commission at some future date. Unless the RCA system is authorized as a broadcast service, [fol. 26] RCA's investment in its color system will be substantially impaired.

82. The adoption of the incompatible CBS color television system will impede the future growth of the television industry upon which RCA and NBC, with all other television manufacturers and broadcasters, depend. It will as well imperil the employment not only of the more than 30,000 people RCA and NBC employ in television manufacture, but also the hundreds of thousands employed throughout the television industry.

83. The plaintiffs have no adequate remedy at law.

Wherefore, plaintiffs pray:

1. That this Court, as soon as practicable, convene a specially constituted court of three judges, as required by Title 28, United States Code (28 U. S. C. Sections 2284, 2325), and that a temporary or interlocutory injunction be entered herein restraining, enjoining and suspending until the further order of this Court the promulgation, operation, and execution of the Order.

2. That, after final hearing, this Court adjudge, order and decree that the Order is, and has at all times been, beyond the lawful authority of the Commission, in violation of the legal rights of plaintiffs, and is wholly void, arbitrary and unreasonable, and that the Order be perpetually vacated, set aside, suspended and annulled, and the promulgation, operation and execution thereof perpetually restrained and enjoined.

[fol. 27] 3. That plaintiffs may have such other and further relief in the premises as to equity and justice may ap-

pertain and as may be deemed by this Court to be adequate and proper under the circumstances.

Weymouth Kirkland & Kirkland, Fleming, Green, Martin & Ellis. By Weymouth Kirkland, A member of the Firm, Attorneys for Plaintiffs, Office and P. O. Address, 33 N. LaSalle Street, Chicago, Illinois.

Of Counsel: Cahill, Gordon, Zachry & Reindel, New York City. John T. Cahill, Joseph V. Heffernan, John W. Nields.

[Verification Follows]

[fol. 28] *Duly sworn to by Frank M. Folsom. Jurat omitted in printing.*

[fol. 29] EXHIBIT "A" TO COMPLAINT

FEDERAL COMMUNICATIONS COMMISSION

Washington 25, D. C.

Mimeo #37460 FCC 49-948

In the Matters of

Docket Nos. 8736 and 8975

Amendment of Section 3.606 of the Commission's Rules and Regulations

Docket No. 9175

Amendment of the Commission's Rules, Regulations and Engineering Standards concerning the Television Broadcast Service

Docket No. 8976

Utilization of Frequencies in the Band 470 to 890 Mcs. for Television Broadcasting

Notice of Further Proposed Rule Making

1. Notice is hereby given of further proposed rule making in the above-entitled matters. For purposes of identifica-

tion, the prior proceeding in the above-entitled matters shall be designated as "Part I" of these proceedings. The proceedings instituted by this notice shall be designated as "Part II" of these proceedings. The above-entitled proceedings are hereby consolidated, and the records therein are hereby reopened.

2. The caption of the proceedings in Docket No. 9175 is hereby amended to read as set forth above, and to eliminate the former reference to the FM Broadcast Service. The Commission is making no proposal at this time concerning the FM broadcast rules, regulations, or standards, and will consider no proposals on this subject from other persons in the above-entitled proceedings. If the evidence taken in this proceeding, heretofore, or hereafter, should warrant a proposal for the amendment of the rules, regulations and standards concerning FM broadcast service, the Commission will institute a separate proceeding for that purpose.

3. The Commission's proposals for amendment of Section 3.606 of its Rules and Regulations containing the table of allocation of television channels set forth in the following notices heretofore issued in Docket Nos. 8736 and 8975, *are hereby withdrawn:*

(a) Notice of Proposed Rule Making (FCC 48-126) released January 20, 1948.

(b) Notice of Proposed Rule Making (FCC 48-1569) released May 6, 1948.

(c) Supplemental Notice of Proposed Rule Making (FCC 48-1812) released July 16, 1948.

[fol. 30] 4. In view of the withdrawal of the Commission's proposals in the above notices, all interested persons who have heretofore participated in the above-entitled proceedings, may participate further only by complying with the procedures set forth in paragraphs 14 and 15 hereof. Persons who have indicated their interest in allocation of television channels to specific areas (by petition, letter, or application heretofore filed with the Commission) may participate in this proceeding only by complying with the procedures set forth in said paragraphs.

5. The Commission proposes to amend Parts 2 and 3 of its Rules and Regulations ("Rules Governing Television Broadcast Stations") and its "Standards of Good Engineering Practice Concerning Television Broadcast Sta-

tions" as set forth in *Appendices A, B, C and D* attached hereto.

6. It is evident that an understanding must be reached between the United States of America and Canada, Mexico and Cuba with respect to the allocation of television channels along their mutual borders. Such an understanding is necessary in order to prevent undue interference between television stations in the respective countries and in order to provide for a fair, efficient and equitable allocation of television channels between the United States and the above countries. Accordingly, in Appendix D herein, the Commission has included certain assignments for Canada, Mexico and Cuba which might be allocated on the same basis of the overall proposal if the borders between the countries did not exist. No formal agreements have been made and these potential assignments for Canada, Mexico and Cuba are included in the proposal only for illustrative purposes and to show the effect on the above "Table" of a reasonable number of assignments to Canada, Mexico and Cuba. The Commission proposes to recommend that the State Department request the Canadian, Mexican and Cuban Governments to enter into formal agreements as soon as possible.

7. In preparing the "Table" of television channel allocations set forth in Appendix C attached hereto, the Commission has not altered existing television authorizations except in three instances. These exceptions resulted from the Commission's efforts to arrive at an equitable allocation of television channels between the United States and the Dominion of Canada. The three cities so affected are Cleveland, Ohio, Syracuse, New York and Rochester, New York. The changes proposed by the Commission with respect to these cities and the basis for its proposals are set forth in the following paragraphs.

8. In the existing "Table" of television allocations set forth in Section 3.606 of the Commission's Rules and Regulations, Channels 5, 8 and 10 are allocated to Syracuse, New York. A construction permit to operate on Channel 5 in Syracuse is held by the Central New York Broadcasting Co. (WSYR-TV). In the proposed "Table" in Appendix C attached hereto the Commission proposes to delete Channel 5 from Syracuse and substitute Channel 3 in its place. Should this proposal be adopted by the Commission, it is hereby proposed to modify the construction permit

held by Central New York Broadcasting Company for tele-
[fol. 31] vision station WSYR-TV in Syracuse by substituting therein Channel 3 in place of Channel 5. In the light of the information set forth in paragraph "7" above, it is the judgment of the Commission that its actions will result in the maximum utilization of television channels in the United States and Canada, and will promote the public interest, convenience and necessity, and the provisions of the Communications Act of 1934, as amended. *Accordingly*, pursuant to the provisions of Sections 303(f) and 312(b) of the Communications Act of 1934, as amended, Central New York Broadcasting Co. (WSYR-TV), Syracuse, New York, is directed to *Show Cause* in these proceedings and in accordance with the procedures set forth in paragraphs 14 and 15 herein, why its construction permit should not be modified accordingly in the event the Commission deletes Channel 5 from Syracuse and substitutes Channel 3 in its place.

9. In the existing "Table" of television allocations set forth in Section 3.606 of the Commission's rules, Channels 2, 6 and 11 are allocated to Rochester, New York. A construction permit to operate on Channel 6 in Rochester is held by the Stromberg-Carlson Co. (WHTM). In the proposed "Table" in Appendix C attached hereto the Commission proposes to delete Channels 2, 6 and 11 from Rochester and substitute Channels 5, 22, 32 and 44 in their places. Should this proposal be adopted by the Commission, it is hereby proposed to modify the construction permit held by Stromberg-Carlson Co., for television station WHTM, Rochester, New York, by substituting therein Channel 5 in place of Channel 6. In the light of the information set forth in paragraph "7" above, it is the judgment of the Commission that its actions will result in the maximum utilization of television channels in the United States and Canada, and will promote the public interest, convenience, and necessity, and the provisions of the Communications Act of 1934, as amended. *Accordingly*, pursuant to the provisions of Section 303(f) and 312(b) of the Communications Act of 1934, as amended, Stromberg-Carlson Co. (WHTM), Rochester, New York, is directed to *Show Cause* in these proceedings and in accordance with the procedures set forth in paragraphs 14 and 15 herein, why its construction permit should not be modified accordingly in the event

the Commission deletes Channel 6 from Rochester and substitutes Channel 5 in its place.

10. In the Existing "Table" of television allocations set forth in Section 3.606 of the Commission's Rules, Channels 2, 4, 5, 7 and 9 are allocated to Cleveland, Ohio. A construction permit to operate on Channel 9 in Cleveland is held by the Empire Coil Co., Inc (WXEL). In the proposed "Table" in Appendix C attached hereto the Commission proposes to delete Channels 2, 7 and 9 from Cleveland and substitute Channels 8, 11, 40 and 42 in their place. Should this proposal be adopted by the Commission, it is hereby [fol. 32] proposed to modify the construction permit held by Empire Coil Co., Inc. for television station WXEL in Cleveland by substituting therein Channel 11 in place of Channel 9. In the light of the information set forth in paragraph "7" above, it is the judgment of the Commission that its actions will result in the maximum utilization of television channels in the United States and Canada, and will promote the public interest, convenience and necessity, and the provisions of the Communications Act of 1934, as amended, *Accordingly*, pursuant to the provisions of Section 303(f) and 312(b) of the Communications Act of 1934, as amended, Empire Coil Co., Inc. (WXEL), Cleveland, Ohio, is directed to *Show Cause* in these proceedings and in accordance with the procedures set forth in paragraphs 14 and 15 herein, why its construction permit should not be modified accordingly in the event the Commission deletes Channel 9 from Cleveland and substitutes Channel 11 in its place.

11. On May 25, 1949, the Commission adopted an order (FCC 49-729), which added the following issue in Docket No. 8976:

> "5. To receive evidence and data with respect to the question whether there should be an allocation of the band 470-500 Mcs to multi-channel broad band common carrier mobile radio operation in lieu of television broadcasting."

This issue was added to the proceeding upon the petition of The Bell Telephone Laboratories, Inc., requesting an allocation in the band 400-500 Mcs. for multi-channel broad band common carrier mobile radio operation in lieu of television broadcasting. The Commission is not making any

proposal with respect to the above issue but will consider all written comments and evidence supporting or opposing said petition. Interested persons may submit written comments or evidence concerning said proposals by complying with the procedures set forth in paragraphs 14 and 15 herein.

12. On November 30, 1948, Raymond M. Wilmotte and Paul A. deMars filed with the Commission a petition entitled "A Petition Regarding a System for Television at U.H.F.," urging that the Commission adopt a proposed system of television broadcasting referred to as "Polycasting." Petitioners, and other interested persons, may submit details concerning the said proposal and may offer evidence with respect thereto by complying with the procedures set forth in paragraphs 14 and 15 herein.

[fol. 33] 13. (a) Appendix A hereto describes the conditions upon which the Commission will receive proposals for a change in Transmission Standards on Channels 2 through 55, looking toward the establishment of color television. Persons with relevant information, especially those who have heretofore supplied information concerning color television or have demonstrated experimental color operation to the Commission, should file proposals in accordance with Appendix A and should be prepared to submit information concerning color breakup, flicker, color fringing, image registration, color fidelity, picture brightness, camera light efficiency, definition, field tests, and details with respect to modification of transmitters and receivers to provide the degree of compatibility contemplated by Appendix A, paragraph II-C-2.

(b) The Commission has heretofore received evidence concerning a method of airborne television, or "Stratovision", in Docket No. 8976.

(c) The Commission has received informal suggestions concerning the possible provision for non-commercial educational television broadcast stations in the 470 to 890 Mc. band.

(d) Interested persons desiring to submit comments or evidence concerning these matters, or concerning other matters upon which the Commission is making no proposal at this time, may do so upon complying with the procedures set forth in paragraphs 14 and 15 herein.

14. (a) *On or before August 8, 1949*, any interested person who is of the opinion that the proposals herein

should not be adopted or should not be adopted in the form set forth herein, may file with the Commission written comments (including data, views or arguments) concerning said proposals, and interested persons favoring the proposals herein may file such written comments in support thereof. All written comments must be clear and specific as to the proposals made therein and must be accompanied by supporting engineering statements. No comments or statements will be accepted after August 8, 1949, unless a later date is provided by Commission order. Any person filing comments who owns or has the right to sublicense United States unexpired patents with claims directed to or covering operations or equipment specifically called for by the transmission standards proposed herein, or which are proposed by other persons during this proceeding, shall file a statement on or before the opening date of the hearing or such later date as the Commission may by order provide showing (i) the number of each such patent, and (ii) the pertinent claims therein.

(b) *On or before August 19, 1949,* interested persons desiring to submit written comments (including data, views or arguments) *in opposition to comments or counterproposals* filed with respect to the Commission's proposals herein may file such opposing comments, which must be accompanied by supporting engineering statements. Oppositions to counterproposals will not be accepted by the Commission if such oppositions advance any new proposals, nor will they be accepted after August 19, 1949, unless a later date is provided by Commission order.

(c) In accordance with Section 1.764 of the Commission's Rules and Regulations, an original and 14 copies of such written comment, statement or exhibit shall be filed with the Commission.

[fol. 34] 15. (a) Notice is hereby given that a hearing will be held in the above-entitled matters, before the Commission *en banc*, commencing on August 29, 1949, at 10:00 a.m. in Washington, D. C., (at a place to be designated by subsequent notice) for the purpose of hearing testimony and receiving evidence regarding the Commission's proposals, such other proposals as are duly and timely filed by interested persons, and such other evidence as the Commission may consider desirable and pertinent. Any interested person who has filed written comments (including data, views or arguments) in accordance with the provisions of

Paragraph 14 herein may participate in said hearing. The Commission reserves the right to require the presentation of evidence on any matter pertinent to this hearing by any person whether or not such person has filed a statement or comments. In order to expedite the conduct of the hearing, and to enable all parties to be fully prepared in advance thereof, it is urged that every effort be made by interested parties to file 10 copies of their proposed exhibits at least 5 days prior to the date of hearing. Amendments and supplements to the exhibits should be filed as soon as possible prior to the hearing.

(b) Comments and statements directed toward specific allocations in the Commission's proposed "Table" in Section 3.606 of the Commission's Rules and Regulations shall show not only the effect which the proposals in said comments and statements will have on the service in the particular communities involved but also *the overall effect* thereof with specific reference to the priorities set forth in Section III-A-1 in Appendix A herein.

(c) Persons who have failed to file timely written comments or statements as required by paragraphs 14 and 15 herein will not be permitted to adduce testimony or to offer any exhibits in evidence at the hearing, nor will such persons be permitted to cross-examine any of the witnesses appearing at the hearing.

(d) In view of the comprehensivs nature of the proceedings herein and the desirability of concluding the hearing as soon as possible, it is requested that parties incorporate as much evidence as is practicable in the exhibits which they plan to submit. In this connection participants will be required to submit at the hearing at least 20 copies of each exhibit to the Commission. In addition, participants should plan, if possible, to have available 100 additional copies of each exhibit for distribution to interested persons.

(e) In appropriate instances the Commission will permit participants at the hearing to incorporate by reference portions of the records of prior hearings *provided* that notice of intention to make such offer at the hearing is set forth in the written comments filed by the offering party and that the docket number and transcript pages are specifically identified in said written comments.

[fols. 35-36] 16. Following the closing of the record and the conclusion of oral arguments, the Commission upon consideration of all proposals, counterproposals, and evidence

in this proceeding will adopt such rules, regulations and standards, as will best serve the public interest, convenience or necessity.

17. Persons who are contemplating filing applications for new television broadcast stations, or filing amendments to pending applications for new television broadcast stations, are requested to postpone the filing of such applications or amendments pending a final determination on the rules, standards and allocations proposed in this proceeding. Upon the issuance of final rules, standards and allocations in this proceeding, the Commission will issue an announcement providing a reasonable period of time during which new applications may be filed and pending applications may be amended, in conformity with the new rules, standards and allocations. Applicants are requested to comply with this paragraph in order to eliminate unnecessary administrative effort and to save themselves the possibly needless expense of preparing and filing applications and amendments which may not be in conformity with the rules, standards and allocations as finally adopted.

18. A copy of this Notice will be mailed to each person who appeared in Part I of the proceedings in the above-entitled matters. Subsequent notices will be served only on persons who participate in the proceedings herein in accordance with the provisions of paragraphs 14 and 15 of this Notice.

19. Authority to issue the proposals herein is vested in the Commission by Sections 4(i) 301, 303(b), (c), (d), (e), (f), (g), (h), (r), and 307(b) of the Communications Act of 1934, as amended.

Federal Communications Commission, T. J. Slowie, Secretary.

Adopted: July 8, 1949.
Released: July 11, 1949.

38055-3-7/49

APPENDIX A

The Commission proposes to amend its Rules and Regulations and Standards of Good Engineering Practice Concerning Television Broadcast Stations so as to accomplish the matters set forth below:

I. Number of Channels

A. In addition to the twelve V.H.F. six megacycle channels presently assigned (Numbered 2 through 13) for television broadcasting, the Commission proposes to add an additional 42 six megacycle channels which will be numbered consecutively channels 14 through 55. Channel 14 will begin at approximately 470 Mc or 500 Mc depending upon the action to be taken by the Commission with respect to the request of The Bell Telephone Laboratories, Inc. for space in the U.H.F. band for a broad-band system of Mobile Communications (See Order of May 25, 1949 - F.C.C. 49-729). The remaining channels will be in a continuous band immediately contiguous to Channel 14; 32 of these channels will be used for Metropolitan stations and 10 for Community Stations.

B. The balance of the band which is allocated to experimental television broadcasting will remain available for further experimentation in television broadcasting.

II. Transmission Standards

A. The Commission proposes that the Transmission Standards for channels 14 through 55 as well as for channels 2 through 13 shall be those standards which are set forth in the Standards of Good Engineering Practice concerning Television Broadcast Stations under Heading 2 entitled "Transmission Standards and Changes or Modifications Thereof."

B. The Commission will give consideration to proposals for a change in Transmission Standards on channels 2 through 55 looking toward color television or other television systems. Any such proposals shall:

1. Be specific as to any change or changes in the Transmission Standards proposed; and

2. Shall contain a showing as to the changes or modifications in existing receivers which would be required in order to enable them to receive programs transmitted in accordance with the new standards.

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C. It is proposed to consider changes in Transmission Standards for channels 2 through 55 only upon a showing in these proceedings that:

1. Such system can operate in a 6-megacycle channel; and

2. Existing television receivers designed to receive television programs transmitted in accordance with present transmission standards, will be able to receive television programs transmitted in accordance with the proposed new standards simply by making relatively minor modifications in such existing receivers.

III. Allocation Principles

A. Allocation Table

1. The television channels available for use in the various communities are set forth in the "Table" in Appendix C. In setting up this table, the Commission has endeavored to meet the twofold objective set forth in Sections 1 and 307(b) of the Communications Act of 1934 - to provide television service, as far as possible, to all people of the United States and to provide a fair, efficient and equitable distribution of television broadcast stations to the several states and communities. The Commission has set forth below the principles, in terms of priority, which form the basis of the allocation table. These priorities are as follows:

Priority No. 1 - To provide at least one television service to all parts of the United States.

Priority No. 2 - To provide each community with at least one television broadcast station.

Priority No. 3 - To provide a choice of at least two television services to all parts of the United States.

Priority No. 4 - To provide each community with at least two television broadcast stations.

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Priority No. 5 - Any channels which remain unassigned under the foregoing priorities will be assigned to the various communities depending on the size of the population of such community, the geographical location of such community, and the number of television services available to such community from television stations located in other communities.

2. As used in the preceding subsection "community" includes only those communities which had at least one authorization for a Standard, FM or Television broadcast station on July 1, 1949.* All communities within a metropolitan district shall be considered as a single community for the purpose of the preceding subsection except where the allocation table specifically otherwise states. Whenever an assignment is made in the allocation table to a metropolitan district, such assignment shall be available to any community located within such Metropolitan District, except where otherwise specifically provided in the allocation table. In the case of some metropolitan districts, some of the communities are located at such a distance from the principal city thereof that a better coverage of the metropolitan district results if a separate assignment is made to such communities. The following are the exceptions mentioned above:

Waukegan, Illinois; Gary, Indiana; Annapolis, Maryland; Brockton, Mass.; Pontiac, Michigan; Asbury Park, New Jersey; Uniontown and Greensburg, Pa.; New Brunswick, New Jersey.

Accordingly, the Commission proposes specific assignments in each of these cities on one of the ten community channels, 46-55.

3. Whenever an assignment is made in the allocation table to a community not within a Metropolitan District, such channel will also be available, without the necessity of rule-making proceedings, to any other community, not within a Metropolitan District, whose geographical center is located within 15 miles from the geographical center of the community in question.

* As to some of these communities, no provision has been made in the Allocation Table. It is contemplated that these communities will utilize community channels.

4. Except as provided in "2" and "3" above, no application for a television station in a community specified in the Allocation Table will be accepted for filing which specifies a channel not contained in the Allocation Table. Persons desiring to apply for a channel not specified in the Allocation Table must first secure an amendment to such table through appropriate rule-making proceedings. Changes will be made in the Allocation Table only if a showing is made that:

   a. Such change is consistent with the priorities set forth in III-A-1;

   b. Such change will not result in the reduction of the basic service area of an existing television broadcast station or of a television station provided for in the Allocation Table as defined in III B; and

   c. Such change is in the public interest.

5. If a person desires to file an application for a community not within a metropolitan district and not specified in the Allocation Table, he may file an application for a community station on Channels 46-55, without the necessity of rule-making proceedings. If such person desires a Metropolitan station in a community not specified in the Allocation Table, he must first secure an amendment to such table through appropriate rule-making proceedings by making the showing specified in the preceding paragraph.

6. As used in this part, Metropolitan Districts are as defined in the United States 1940 Census.

B. Grades of Service*

1. Television broadcast service is classified into three grades of service which are defined in the table below:

PROPOSED

* The methods and assumptions used in establishing the grades of service and the required field intensities in accordance with the above definitions, are set forth in Appendix B.

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Grade of Service	Permissible Interference Ratios		Service Availability	
	Co-Channel	Adjacent Channel		
	Desired to Undesired	Desired to Undesired	Percent Time	Percent Locations
A	55 db	20 db	90%	90%
B	46 db	12 db	90%	70%
C	40 db	6 db	90%	50%

It is recognized that by means of synchronized or offset carrier operation some improvement in the interference ratio is possible. The Commission hopes to encourage such operations but does not intend to use them as a means of reducing separation between stations but rather to extend the service area of stations and to improve the quality of television reception.

2. The following median field intensities are required for service:

Grade	Field Intensity in db above 1 uv/m		
	Channels 2-6	Channels 7-13	Channels 14-55
A	74(5000)*	77(7000)	80(10,000)
B	68(2500)	71(3500)	74(5,000)
C	47(220)	56(632)	62(1,264)

3. The Commission proposes the use of iso-service contours which express service in terms of the ratio between desired and undesired signal in decibels, or the minimum required signal levels in decibel above one microvolt per meter. This has been done in order to facilitate computation of service and interference field intensities. Likewise, the same terms may be carried over to the output of the transmitter, transmission line loss and antenna gain. This has the advantage of using the same unit throughout the service whether in the transmitting equipment or in the field and has the additional advantage that a decibel of power added at the transmitter results in a decibel of increased field intensity. In order to place these matters

* The field intensities are expressed in db above one microvolt per meter. The numbers in parentheses are the field intensities in microvolts per meter.

on a related basis, the decibels with respect to transmitter power and antenna gain as well as field intensity must be expressed as decibels with reference to some given level.

Field intensity is expressed either in decibels above an undesired signal or decibels above a reference level which has been chosen as one microvolt per meter. A convenient reference level of transmitter power is 1 kilowatt. The propagation curves of the Report of the Ad Hoc Committee, Volume I,* referred to in Appendix B, are based upon the radiation in the equatorial plane of a half wave dipole antenna having an effective radiated power of one kilowatt. Antenna gain is expressed as the ratio in db of the maximum radiation from the antenna to the radiation in the equatorial plane of a half wave dipole with equal power imput.

C. Classes of Stations

1. Community Stations: Television channels Nos. 46 to 55 will be assigned exclusively to community stations for use only in those communities which are not part of a metropolitan district (except for those special cases set forth in IIIA2) and to which no assignment has been made in the Allocation Table. Community stations will be authorized with an effective radiated peak power of not less than 7 db (5kw) and not more than 13 db (20 kw) and with an antenna height of 500 feet above average terrain as determined by methods prescribed, in the Standards of Good Engineering Practice Concerning Television Broadcast Stations. Co-channel community stations will not be assigned less than 140 miles apart, and adjacent channel community stations will not be assigned less than 60 miles apart.

2. Metropolitan Stations:

   a. Metropolitan stations are designed primarily to render service to a single metropolitan district or a principal city and to the surrounding rural area.

* This Report was made public on June 8, 1949 (See Public Notice FCC 49-773). Copies of the Report are available on request.

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b. Except as provided in "5" below, metropolitan stations will be authorized with an effective radiated peak power lying between the maximum and minimum limits set forth in the table below with an antenna height of 500 feet above the average terrain, as determined by the methods prescribed in the Standards of Good Engineering Practice Concerning Television Broadcast Stations.

Channels	Minimum	Maximum
2 - 6	10 db (10 kw)	20 db (100 kw)
7 - 13	10 db (10 kw)	20 db (100 kw)
14 - 55	10 db (10 kw)	23 db (200 kw)

3. Use of Antenna Heights other than 500 feet--Where higher antenna heights are available, they should be used but in such cases the Commission will require a reduction in the effective radiated peak power so that interference caused to the Grade A service of adjacent and co-channel stations shall not be greater than that which would be caused by the maximum power recognized for a metropolitan or community station with antenna height of 500 feet above average terrain in accordance with the methods specified in Appendix B. Where it is shown that an antenna height of 500 feet is not available, the Commission may authorize the use of a lower height antenna but will not permit an increase in radiated power in excess of the maximum listed above.

4. Horizontal Increases in Power--The Commission intends from time to time to consider horizontal increases in maximum power for all community and metropolitan stations.

5. Wide Coverage Stations or Rural Stations--The Commission proposes to modify Section 3.605 of the Rules and Regulations dealing with rural stations. The Commission intends to provide for the use of wide coverage stations located at high elevations consistent with other sections of the Rules and Regulations and the Allocation Table.

The power height relation used in calculating the Allocation Table will be regarded as a "norm" and power or antenna heights greater than the Allocation Table will be authorized, provided the increase is beneficial to the Allocation Table and is consistent with the Priorities stated in Section III A.

D. Service Areas of Television Broadcast Stations

1. Each television broadcast station shall render Grade A service, whenever technically feasible, but in no event less than Grade B service, to the entire community or the entire metropolitan district, and such entire community or metropolitan district shall constitute a station's basic service area.* No television station will be authorized either before or after a hearing which, by reference to the methods set forth in Appendix B, does not render service as above specified and the engineering proposal of which precludes operation with maximum power consistent with the rules contained herein.

2. No station will be authorized either before or after a hearing, which, by reference to the methods set forth in Appendix B, will reduce the basic service area of an existing station (at its authorized site) or of a station provided for in the Allocation Table (at an assumed site in the geographical center of its community), operating with maximum power. Reduction of Grade C service area, or of Grade B or Grade A service areas beyond the basic service area described above, of an existing station (at its authorized site) or of a station provided for in the Allocation Table (at an assumed site in the geographical center of its community), operating with maximum power, will be permitted only if the loss in service does not violate any of the priorities set forth above and that the new service created is of a higher priority than the service area being reduced.

3. III C above makes provision for both minimum and maximum power for the several classes of stations. Since television is a new service and the number of receivers in the hands of the public is relatively

*In case of the metropolitan districts mentioned in III A-2 above, the communities specifically mentioned in that paragraph shall not be part of the basic service area of stations located in the metropolitan district but shall be separate basic service areas of stations located in those communities.

small, it is recognized that it may require several years for some stations to reach their maximum power. In order to make sure that the public will receive the maximum television service possible, the Allocation Table has been constructed on the basis of maximum power for each station. Any changes in the allocation plan will have to be based upon a showing that the allocation proposed will be able to utilize maximum power and without resulting in any reduction in the basic service area (as above defined) of existing stations (from their authorized site) or of stations specified in the Allocation Table (at an assumed site in the geographical center of the community) operating with maximum power.

4. Methods for describing service areas and interference are set forth in Appendix B. The methods therein described include the propagation of radio waves through the lower atmosphere only. These propagation charts are based on an extensive number of measurements made at various locations over a long period of time. It is recognized that these charts will have to be revised from time to time as more measurements are made and interested persons are encouraged to make as many measurements as possible and submit them to the Commission. The Commission is satisfied that on the basis of the data presently available to it the data underlying the propagation charts are sufficient to afford an adequate statistical basis of describing field intensities under average conditions, but it is expected that there may be substantial variations in individual areas. It is also realized that propagation to distances of the order of 500 to 1500 miles via the sporadic E layer and to distances beyond via the F2 layer may take place for small percentages of the time in certain of the channels. However, since such interference may occur over extremely large distances, it is not possible to protect stations against such interference unless operation on such channels were limited to one or at the best a few stations. In order to provide stations for the various communities, the Commission has determined that the overall public interest is better served by not protecting stations against this type of interference.

E. Directional Transmitting Antennas

1. With the exceptions noted in the footnote*, the Allocation Table makes no provision as such for directional transmitting antennas and the Commission does not propose to make changes in the plan based upon the use of such antennas. However, it is recognized that a directional transmitting antenna may be useful in certain situations in order that a particular site may be utilized or overall service improved. Accordingly, directional transmitting antennas will be permitted in appropriate cases for use on channels contained in the Allocation Table.

2. The authorization of a directional antenna will not excuse compliance with the service area requirements set forth above nor will it be the basis for permitting reduction of basic service areas.

3. Since the wave-lengths involved in television are much shorter than in the case of standard broadcasting, it is evident that wires, towers, and other objects which may serve as reflecting surfaces have considerably larger dimensions in terms of wave lengths in the television band as compared with the standard broadcast band and hence the problem of external reflections is considerably aggravated. Accordingly, nulls below a certain value become doubtful in their protective value since they may be counteracted by the external reflections. Based upon the best available data, the Commission is of the opinion that nulls deeper than minus 10 db as compared to the maximum value of radiation in any direction may not be practicable.

*The two exceptions are WGAL-TV on Channel 4 in Lancaster, Pa., and WDEL-TV on Channel 7 in Wilmington, Delaware. Both of these stations were authorized under the original allocation plan with 1 kw power and are too close to other stations on the same channel to permit operation with maximum power on a non-directional basis. The Commission proposes to permit those stations to utilize directional antennas in order to permit them eventually to utilize increased power.

38055-4-7/49

APPENDIX B

I. Specifications of Required Field Intensities.

The required field intensities specified in Appendix A, Section III B, were determined in accordance with the following assumptions and procedure:

A. Grade A Service - Required Field Intensities, in db above 1 microvolt per meter.

(a) To overcome receiver noise,

		63 Mc	195 Mc	600 Mc[1]
(1)	Thermal Noise (db)[2]	7	7	7
(2)	Receiver Noise Figure	12	12	15
(3)	Peak Vis. Car./RMS Noise	30	30	30
(4)	Trans. Line Loss[3]	1	2	5
(5)	Antenna Eff. Length[4]	-3	6	8
(6)	Local Field Intensity	47	57	65
(7)	90% Terrain Factor[5]	11	11	15
(8)	Median Field Int.[6] (db)	58	68	80

(b) To overcome local noise and interference,

	63 Mc	195 Mc	600 Mc
Median Field Intensity (db)	74	77	80

(c) Required urban field intensities to overcome both (a) and (b),

	63 Mc	195 Mc	600 Mc
Median Field Intensity (db)	74	77	80

1 For the purposes of preparing a table of allocations, the frequencies herein specified are to apply to the television channels as follows: 63 Mc - channels 2-6; 195 Mc - channels 7-13; 600 Mc - channels 14-55.

2 Reference level db above 1 uv across 300 ohms impedance.

3 Transmission line is assumed to consist of 50 feet of RG 59 U coaxial cable for 63 and 195 megacycles and of 50 feet of twin-lead cable at 600 megacycles.

4 The antenna is assumed to consist of a half-wave dipole at 63 and 195 megacycles and of a rhombic with 8 db gain at 600 megacycles.

5 The terrain correction factors for 63 and 195 megacycles are taken from the curve R(L) and the factor for 600 megacycles taken from the curve r(L) of Figure 2 of the Ad Hoc Report.

6 Time fading of the desired signal is not considered significant for grade A service. The median field intensity is equivalent to the field F (50,50) specified in Appendix B, Section II A.

For the purpose of estimating the required field intensities at the antenna, it has been assumed that half-wave dipoles connected to the set by 50 feet of RG 59U coaxial line are typical for 63 to 195 Mc operation. In the frequency range near 600 Mc, a small rhombic with 300 ohm line has been assumed. It is realized that it is neither desirable nor practical in some heavily built-up areas to meet these assumptions and that inside antennas will be used. If it is assumed that the inside antenna will have an effective length equal to that of a half-wave dipole and that the transmission line loss is negligible, the local field intensities required will be 46, 55 and 68 db above one microvolt per meter, respectively, for 63, 195 and 600 Mc. However, the median field intensities required under these conditions cannot be stated with assurance, because the average terrain distributions which have been calculated from available measurements apply only to exterior conditions in suburban and rural areas. If the range of signal variation in building interiors is comparable to the exterior range, the 74 db median signal level (5000 microvolts per meter) specified to overcome local noise and interference in (b) would be adequate at 63 and 195 Mc. There is some opinion, but no measurements, which indicate that the 74 db signal is adequate at 63 Mc but not at 195 Mc. In order to meet this opinion and to equalize the grade A service areas for equal powers which are indicated at 63 and 195 megacycles, the field intensity required for grade A service at 195 megacycles has been raised to 77 db. Until reliable data are available to indicate otherwise, the above median field intensities will be required within the principal city of the metropolitan area. Until experience indicates the practicability of operating indoor antennas at frequencies near 600 megacycles, only outdoor antennas will be assumed.

B. Grade B Service - Required Field Intensities, in db above 1 microvolt per meter.

(a) To overcome receiver noise,

		63 Mc	195 Mc	600 Mc
(1)	Thermal Noise (db)	7	7	7
(2)	Receiver Noise Figure	12	12	15
(3)	Peak Vis. Car. RMS Noise	30	30	30
(4)	Trans. Line Loss	1	2	5
(5)	Antenna Eff. Length	-3	6	8
(6)	Local Field Intensity	47	57	65
(7)	70% Terrain Factor	4	4	6
(8)	90% Time Factor	3	3	3
(9)	Median Field Intensity (db)	54	64	74

(b) To overcome local noise and interference,

	63 Mc	195 Mc	600 Mc
Median Field Intensity (db)	68	71	74

(c) Required urban field intensities to overcome both (a) and (b),

	63 Mc	195 Mc	600 Mc
Median Field Intensity (db)	68	71	74

The median field intensities for urban grade B service are 6 db lower than those for grade A service. This reduction is essentially a reduction from the desired quality of service at 90% of locations to 70% of locations in accordance with Appendix A, Section III B 1.

C. Grade C Service - Rural Field Intensities, in db above 1 microvolt per meter, required to overcome receiver noise.

		63 Mc	195 Mc	600 Mc
(1)	Thermal Noise (db)	7	7	7
(2)	Receiver Noise Figure	12	12	15
(3)	Peak Vis. Car./RMS Noise	30	30	30
(4)	Trans. Line Loss	1	2	5
(5)	Antenna Effective Length[7]	-9	0	-3
(6)	Local Field Intensity	41	51	60
(7)	50% Terrain Factor	0	0	0
(8)	90% Time Fading Factor[8]	6	5	2
(9)	Median Field Intensity (db)	47	56	62

D. Specifications of Permissible Interference Ratios.

The permissible interference ratios specified in Appendix A, Section III B, were determined in accordance with the following assumptions and procedure. The permissible cochannel desired to undesired station ratio available at the location of the receiving antenna was taken to be 40 db. The permissible adjacent channel ratio available at the receiving antenna location was taken as 6 db. In order to make the permissible ratios, which are in terms of the relative field intensities expected at 50% of receiver locations, available to the percentages of receiving locations specified for grades A and B service in Appendix A, Section III B, the following terrain factors have been added:

(a) Grade A Service.

	Cochannel	Adjacent Channel
(1) Local Desired/Undesired Ratio	40	6
(2) 90% Terrain Factor r(L)	15	15
(3) 50% Location d/u Ratio	55 db	21 db

(b) Grade B Service.

	Cochannel	Adjacent Channel
(1) Local Desired/Undesired Ratio	40	6
(2) 70% Terrain Factor r(L)	6	6
(3) 50% Location d/u Ratio	46 db	12 db

[7] Antennas with a 6 db gain compared to a dipole are assumed for 63 and 195 megacycles, and an antenna gain of 13 db for 600 megacycles.

[8] The time fading factors decrease with increasing frequency because the grade C service radii decrease.

(c) Grade C Service.

	Cochannel	Adjacent Channel
50% Location d/u Ratio	40 db	6 db

The terrain factors were taken from the curve r(L) of Figure 2 of the Ad Hoc Report for 90% and 70% of the receiver locations, respectively. Grade C service is specified for 50% of receiver locations, and no terrain factor is required. Permissible ratios which are 6 db higher for grade A service and 2 db higher for grade B service on channels 14 through 55, appear to be justifiable on the basis of present knowledge.

II. Propagation of Television Signals.

For the purpose of predicting the propagation of television signals for the estimation of service and interference areas under the rules proposed in Part II of these proceedings, the following procedures have been observed, in accordance with the recommendations of the Ad Hoc Committee.

A. Prediction of Service Field Intensities.

The field intensities of the service field which will be available, at any percentage of receiving locations for any percentage of the time may be described by the following relation:

(1) $$F'(L,T) = P' + F(50,50) + R(L) + R(T)$$

Where F'(L,T) is the field intensity for L percent of the receiving locations and T percent of the time expressed in decibels above 1 microvolt per meter, P' is the radiated power in db above 1 kilowatt, F(50,50) is the field intensity in decibels above 1 microvolt per meter for 50 percent of the locations and 50 percent of the time for a radiated power of one kilowatt, R(L) is the terrain distribution factor for L percent of locations, and R(T) is the time distribution factor.

The effective radiated power, P', is expressed in decibels above 1 kilowatt radiated from a half-wave dipole and may be calculated by means of the following formula:

(2) $$P' = 10 \log_{10} P - P'' + G$$

In the above, P denotes the actual transmitter power delivered to the transmission line expressed in kilowatts, P" denotes the transmission line and antenna power loss expressed in decibels, and G denotes the gain of the transmitting antenna array in the direction of the receiving location expressed in decibels relative to that of a half-wave dipole.

Appropriate values of F(50,50) may be found in Figures 3, 4, 6 and 7 of the Report of the Ad Hoc Committee, Volume 1. Figure 3 is to be used for channels 2, 3 and 4, Figure 4 for channels 5 and 6, Figure 6 for channels 7 through 55, and Figure 7 for channels 2 through 55 for distances beyond 200 miles, in accordance with the procedure described below. The charts show the field intensities in db above one

microvolt per meter for one kilowatt of effective radiated power to be expected at 50% of the receiving locations for 1%, 10% and 50% of the time, for antenna heights from 100 feet to 2000 feet. The field intensities are based on an effective power of one kilowatt radiated from a half-wave dipole in free space, which produces an unattenuated field intensity at one mile of 103 db above one microvolt per meter (137.6 millivolts per meter). The antenna height to be used with these charts in any particular case is the equivalent height of the center of the radiating element above the average height of the profile between 2 and 10 miles from the transmitter along the desired radial. Where the resulting equivalent antenna height lies between the curves for given antenna heights, interpolation between the curves in proportion to the logarithm of the antenna height shall be used. Special consideration must be given to antenna heights in excess of 2000 feet. Estimates of the field intensities to be obtained from antennas up to 5000 feet in height are contained in Reference D to the Ad Hoc Report. It should be noted that the 5000 feet curve was not endorsed by the Ad Hoc Committee.

For simplicity, the charts do not show the service fields for 90% and 99% of the time, but these fields lie below the 50% curve by the same amounts that the 10% and 1% curves, respectively, lie above the 50% fields. Thus, the time distribution factor R(T) for the 90% and 99% fields may be found by subtracting from the 50% fields the number of db by which the latter lies below the 10% and 1% fields, or:

(3) $F(50,90) = F(50,50) + R(T = 90) = F(50,50) - \left[F(50,10) - F(50,50)\right]$

(4) $F(50,99) = F(50,50) + R(T = 99) = F(50,50) - \left[F(50,1) - F(50,50)\right]$

For other values of T, use may be made of the relation $R(T) = R(T = 1)\ k(T)$. The value of k(T) for any percentage of time T is given in Figure 2 of the Ad Hoc Report.

In order to determine the field intensity which will be exceeded at some percentage of the receiving locations other than 50%, use is also made of Figure 2. For channels 2 through 13, the curve labelled R(L) is to be used; for channels 14 through 55, the curve labelled r(L) is to be used. The departure from the 50% value in db, shown on the left scale, corresponding to the desired percentage of locations on the bottom scale is to be added to the field intensity in db above one microvolt per meter existing at 50% of locations.

For channels 2-13,

(5) $F(L,50) = F(50,50) + R(L)$

For channels 14-55,

(6) $F(L,50) = F(50,50) + r(L)$

Thus, the terrain factor for 90% of locations corresponds to -11 db for channels 2-13 and -15 db for channels 14-55, as shown in Appendix B F A(a)(7).

B. Prediction of Interference from One Undesired Station.

The percentage of receiving locations, L, at any given distance from a desired station and one undesired station at which an acceptable ratio, A, of desired-to-undesired signals is exceeded for T percent of the time may be determined from the following equation:

(7) $$r(L) = A + P'_u + F_u(50,50) - F_d(50,50) - k(T)\sqrt{R_d^2(1) + R_u^2(1)}$$

The subscript d denotes values applicable to the desired signal and the subscript u denotes values applicable to the undesired signal. As explained above, the effective radiated powers of the desired and undesired stations P'_d and P'_u are expressed in db above one kilowatt radiated from a half-wave dipole. $F_u(50,50)$ and $F_d(50,50)$ are taken from the appropriate curve of Figures 3 through 7 of the Ad Hoc Report. $R_d(1)$ and $R_u(1)$ are the time distribution factors for 1% of the time for the desired and the undesired field intensities, respectively. These may be determined by subtracting the (50,50) field intensity from the F(50,1) field intensity indicated for the proper distances on the appropriate curves of Figures 3 through 7 of the Ad Hoc Report.

For channels 2 through 13, the percentage of locations at which the ratio A is exceeded may be read from the probability distribution, r(L), as a function of L in Figure 2 of the Ad Hoc Report. For channels 14-55, a new x(L) line is to be plotted on Figure 2, passing through the common intersection at 0 db and 50% of the locations and having a slope 1.4 times as great as the slope of r(L). x(L) will pass through the -21 db point at 90% of locations.

If the distance at which an acceptable ratio A is to be obtained at a given percentage of locations and for a given percentage of time T is to be determined rapidly, the solution using the above exact expression may be too laborious. A useful approximation is based on the fact that $\sqrt{R_d^2(1) + R_u^2(1)}$ approaches $R_u(1)$ when $R_u(1)$ is much larger than $R_d(1)$. In Reference F it is shown that the approximation gives values which are low by less than 3 db when $R_u(1) = 2.5R_d(1)$. This will always be the case in cochannel interference computations, and nearly always for adjacent channels, when considering service of the order of 90% of the time or 90% of the locations. This is tantamount to assuming for the purposes of rapid calculation that the desired signal is steady and equal to its median value, and that the undesired signal alone is variable.

This makes possible simple graphical methods of computing iso-service contours completely around the desired station. For example, at a point where $F_d(50,50)$ is A decibels greater than $F_u(50,1)$, the ratio A will be exceeded at 50 percent of locations and for 99 percent of time. Thus, the charts for the desired signal F(50,50) and the tropospheric charts F(50,1) and F(50,10) of Figures 3-7 can be used to determine the service contours for 99, 90 percent of the time, respectively, for 50 percent of the locations.

This approximate method can also be applied to the case where it is desired to locate the contour at which an acceptable ratio is exceeded for a percentage of the locations other than 50 percent, by subtracting from the ratio A in db the value of r(L) from Figure 2 corresponding to the percentage of locations for which it is desired to determine the service contour. For example, if it is desired to determine the contour at which the ratio A = 40 db (100:1) will be exceeded at 90 percent of the locations for 90 percent of the time, the value (- 15) db should be subtracted from the 40 db ratio, giving an adjusted ratio of 55 db. The desired contour is found to exist at the locus of points for which $F_d(50,50)$ exceeds $F_u(50,10)$ by the adjusted ratio of 55 db, as taken from the appropriate figure of the Ad Hoc Report.

In the interest of expediting the allocations proceedings the Commission is making use of the charts published by the Ad Hoc Committee. Necessary charts in a form acceptable to the industry together with approved procedures for their use, will be included in the Standards at a later date.

III. Station Separations and Service Radii.

The following tables of service radii and of required station separations have been computed by the methods described in the preceding section for the grades of service specified in Appendix A, Section III B and for the powers provided in Appendix A, Section III C.

Service Radii in Miles

Grade of Service	63 Mc		195 Mc		600 Mc[9]			
	10 db (10 Kw)	20 db (100 Kw)	10 db (10 Kw)	20 db (100 Kw)	7 db (5 Kw)	10 db (10 Kw)	13 db (20 Kw)	23 db (200 Kw)
A	13	20	13	21	7	10	12	21
B	16	27	17	29	12	14	17	29
C	43	57	36	46	28	27	31	43
Cochannel Station Separations in Miles								
A	148	215	111	172	92	103	125	172
B	134	205	108	162	92	99	108	162
C	252	328	164	232	115	125	141	212
Adjacent Channel Station Separations in Miles								
A	50	75	50	73	36	43	49	73
B	50	78	51	78	33	40	46	78
C	105	141	84	109	58	66	75	102

[9] The service radii at 600 Mc are for relatively smooth terrain. For relatively rough terrain such as that found in the vicinity of Washington, D.C. and New York City, an increase of about 10 db in power may be required to provide the same grade of service to the indicated radii.

The Commission has relied upon the above computations and others similarly prepared in accordance with foregoing definitions and methods as well as upon the illustrative studies contained in References E, G, and H of the Ad Hoc Report, in establishing the allocation set forth in Appendix C and in defining the separations for community stations appearing in Appendix A, Section III C.

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APPENDIX C

Introduction

Set forth is a proposed revision of Section 3.606 containing the table showing allocation of television channels to the various communities in the United States. In constructing the table, no change has been made in existing authorizations, with exception of the three stations mentioned in paragraphs 8, 9 and 10 of the Notice of Further Proposed Rule Making. In addition, all existing authoriztions except WDEL-TV in Wilmington, Delaware, and WGAL-TV in Lancaster, Pennsylvania, have been considered on the basis of utilization of maximum power authorized for the class of station in question from their authorized sites. In all other cases, a site in the center of the community in question and maximum power of the station of the class in question have been assumed. An antenna height of 500 feet above average terrain was assumed in all cases.

The Commission has endeavored wherever possible to have a co-channel separation for Metropolitan stations on the VHF band of 220 miles and adjacent channel separation of 110 miles. On the UHF channels it was endeavored to maintain a 200 mile co-channel spacing and a 100 mile adjacent channel spacing. In the case of the community channels which are provided for in the allocation plan, a co-channel separation of 140 miles and adjacent channel separation of 60 miles have been utilized.

The table showing the allocation for the various communities is shown on the following pages; channel assignments marked (c) indicate community channels 46 through 55:

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ALABAMA

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Alexander City	0	17	7
Andalusia	0	26	7
Auburn	0	33	5
Birmingham	4, 6, 13	0	408
Brewton	0	15	3
Clanton	0	27	4
Decatur	0	41	17
Demopolis	0	14	4
Dothan	0	45	17
Enterprise	0	39	4
Eufaula	3	0	6
Florence	0	43	15
Gadsden	0	44	37
Greenville	0	42	5
Huntsville	0	48	13
Jasper	0	28	7
Mobile	5, 8, 11, 48	0	115
Montgomery	7, 12	0	94
Opelika	0	31	8
Selma	0	30	20
Sheffield	0	45	8
Talladega	0	35	9
Tuscaloosa	0	23	27
Troy	0	21	7

PROPOSED

ARIZONA

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Ajo	-	19,21	1
Bisbee	-	19,21	6
Buckeye	-	39	1
Casa Grande	-	24	1
Clarkdale	-	43,45	3
Clifton	-	30	3
Coolidge	-	35,37	2
Douglas	-	15,17	9
Flagstaff	9,11	14,16	5
Ft. Huachuca	-	38	1
Granado	-	15	1
Grand Canyon	-	40	0.6
Globe	-	22	6
Halbrook	-	27,29	1
Hayden	-	28,44	2
Jerome	-	36	2
Kingman	6	29,[illegible]	2
Mesa	-	31,33	7
Miami	-	26	5
Morenci	-	32	3
McNary	-	34	2
Nogales	-	23,25	5
Parker	-	38	1
Phoenix	2,4,5,8,12	15,17	121
Prescott	-	23,25	6
Safford	-	36	2
St. Johns	-	38	1
San Simon	-	40	0.7
Superior	-	42	4
Tombstone	-	29	0.8
Tuscon	3,6,7,10	14,16	37
Wickenburg	-	41	1
Williams	-	30	3
Winslow	-	18,20	5
Yuma	9,13	30,32,34	5

PROPOSED

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ARKANSAS

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Arkadelphia	0	15	5
Batesville	0	20	5
Blytheville	0	44	11
Camden	0	42	9
Conway	0	24	6
Crossett	0	26	5
ElDorado	0	34	16
Fayetteville	0	31	8
Forrest City	0	16	6
Fort Smith	0	16,18	37
Harrison	0	26	4
Helena	0	14	9
Hope	0	22	7
Hot Springs	0	44	21
Jonesboro	0	23,25	12
Little Rock	2, 5, 7, 11	0	127
Magnolia	0	[illegible]	4
Malvern	0	[illegible]	5
Morrilton	0	[illegible]	5
Newport	0	37	4
Paragould	0	18	7
Paris	0	39	3
Pine Bluff	0	38,40	21
Pocahontas	0	34	3
Rogers	0	33	4
Russelville	0	21	6
Siloam Springs	0	42	3
Springdale	0	45	3
Stuttgart	0	33	6
Texarkana	6	25,27	12
West Helena	0	27	5

PROPOSED

C A L I F O R N I A

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Alturas	-	24	2
Arcata	-	30	2
Arroyo Grande	-	32	1
Bakersfield	10	14,16	29
Banning	-	23	4
Barstow	-	25	2
Blythe	-	26	2
Brawley	-	20	12
Bridgeport	-	43	0.4
Calipatria	-	28	2
Calexico	-	22	5
Chico	12	36	9
Coalinga	-	41	5
Colton	-	[illegible]	10
Corona	-	[illegible]	9
Crescent City	-	[illegible]	1
Delano	-	[illegible]	5
Dinuba	-	29	4
El Centro	-	18	10
Escondido	-	41	5
Eureka	-	14,16,28	17
Fillmore	-	28	3
Ft. Bragg	-	24	3
Fresno	8,12	15,17	98
Grass Valley	-	19	6
Hanford	-	19	8
Hollister	-	20	4
Indio	-	31	2
Independence	-	33	0.3
Inyokern	-	43	5
Laguna Beach	-	33	4
Lakeport	-	33	1
Lancaster	-	45	2
Lodi	-	21	11
Lompoc	-	42	3
Los Angeles	2,4,5,7,9,11,13	-	2,904
Merced	-	24	10
Modesto	-	26	16
Mojave	-	20	2
Monterey	-	18	10
Mt. Shasta	-	23	2
Napa	-	29	8
Needles	-	24	4
Oceanside	-	27	5
Oroville	-	27	4
Oxnard	-	22	9
Placerville	-	34	3
Pacific Grove	-	45	6
Palm Springs	-	44	3

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C A L I F O R N I A (CONT'D)

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Paso Robles	-	25	3
Petaluma	-	23	8
Porterville	-	31	6
Portola	-	41	2
Red Bluff	-	25	4
Redding	-	18,42	8
Redlands	-	29	14
Riverside	-	19,21	31
Sacramento	6,10	38,40	159
Salinas	-	30	12
San Bernardino	-	15,17	44
San Diego	3,6,8	14,16	256
San Francisco/Oakland	2,4,5,7,9,11	-	1,428
San Luis Obispo	-	[illegible]	9
San Jose	-	35,37,39	129
Santa Barbara	-	24,26	35
Santa Cruz	-	[illegible]	17
Santa Maria	-	44	9
Santa Paula	-	18	9
Santa Rosa	-	17	13
Scotia	-	37	1
Sonora	-	32	2
Stockton	-	42,44	79
Susanville	-	22	2
Taft	-	36	3
Trona	-	40	2
Tulare	-	23	8
Turlock	-	28	5
Ukiah	-	20	3
Ventura	-	30	13
Victorville	-	37	3
Visalia	-	27	9
Wasco	-	34	5
Watsonville	-	22	9
Weaverville	-	39	0.7
Westwood	-	45	5
Willits	-	43	2
Willows	-	31	2
Yreka	11,13	-	2
Yuba City	-	15	5

COLORADO

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Alamosa	12	31	6
Boulder	-	41,43	13
Burlington	-	15	1
Canon City	-	28	7
Cheyenne Wells	-	39	0.7
Colorado Springs	-	20,24	37
Cortez	-	18	2
Craig	-	26	2
Del Norte	-	33	2
Delta	-	25	4
Denver	2,4,5,7,9	-	384
Durango	-	14	6
Ft. Collins	-	33,35	12
Ft. Morgan	-	[illegible]	5
Glenwood Springs	-	[illegible]	2
Grand Junction	-	[illegible]	12
Greely	-	[illegible]	16
Gunnison	-	19	2
Hugo	-	36	1
La Junta	-	16	7
Lamar	-	19	4
Leadville	-	32	5
Limon	-	22	1
Longmont	-	45	7
Los Animas	-	14	3
Loveland	-	27	6
Meeker	-	42	1
Montrose	-	27	5
Oak Creek	-	34	2
Ouray	-	38	1
Pagosa Springs	-	16	2
Pueblo	3,6,8,10	-	62
Rocky Ford	-	42	3
Saguache	-	40	1
Salida	-	44	5
San Luis	-	23	1
Silvertown	-	29	1
Springfield	-	25	1
Steamboat Springs	-	39	2
Sterling	-	34	7
Trinidad	-	18,21	13
Walden	-	37	0.6
Walsenburg	-	26	6
Wray	-	38	2
Yuma	-	17	2

CONNECTICUT

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Bridgeport	-	14,16	217
Hartford-New Britain	-	30,32,34	502
New Haven	6	20,22	308
Waterbury	-	24,26	145

DELAWARE

Dover	-	47(*)	6
Wilmington /1	7	30,32	189

DISTRICT OF COLUMBIA

Washington	4,5,7,9	32	908

/1 See asterisk footnote to Section III - [illegible] in Appendix A which is part of the Notice of Further Proposed Rule Making herein.

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F L O R I D A

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Apalachicola	-	44	3
Belle-Glade-Chosen	-	26	4
Clear Water	-	43	10
Crestview	-	18	2
Cross City	-	24	2
Daytona Beach	-	32,34,36	23
Deland	-	19	7
Everglades	-	40	0.6
Fort Lauderdale	-	30,32	18
Fort Meyers	-	35,37	11
Fort Pierce	-	39	8
Gainesville	-	14,16	14
Hollywood	-	34	6
Jacksonville	2,4,5,8,10	[illegible]	173
Key West	-	[illegible]	13
Lake City	-	[illegible]	6
Lakeland	-	[illegible]	22
Lakeworth	-	28	7
Leesburg	-	27	5
Mariana	-	37	5
Melbourne	-	15	3
Miami	2,4,5,8,10,[illegible]	--	172
Ocala	-	38	9
Orlando	-	21,23,25	37
Platka	-	40	7
Palm Beach	-	24	4
Panama City	-	14,16	12
Pensacola	-	20,22,24	37
Perry	-	22	3
Plant City	-	31	7
Quincy	-	19	5
Sebring	-	17	3
St. Augustine	-	42,44	12
St. Petersburg-Tampa	3,6,7,9,11,13	--	210
Sanford	-	29	10
Sarasota	-	20	11
Sulpher Springs	-	45	5
Tallahassee	12	28	16
West Palm Beach	-	14,16,18,22	34
Winter Haven	-	41	6

PROPOSED

G E O R G I A

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Albany	0	42	19
Americus	0	20	9
Athens	0	21, 23	21
Atlanta	2, 5, 8, 11	32, 34	302
Augusta	6, 12	17	66
Bainbridge	9	0	6
Brunswick	0	37, 39	15
Cairo	6	0	5
Cartersville	0	39	6
Cedartown	0	19	5
Columbus	0	36, 38, 40	53
Cordele	13	0	8
Dalton	0	25	10
Dawson	0	28	4
Douglas	0	0	5
Dublin	0	41	8
Fitzgerald	0	27	7
Gainesville	0	15	10
Griffin	0	29	13
Jessup	0	35	3
LaGrange	0	22, 24	22
Macon	0	14, 16, 18	58
Milledgeville	0	26	7
Moultrie	0	15	10
Rome	0	42	26
Savannah	3, 9, 11	0	96
Statesboro	0	19	5
Thomasville	0	32, 34	13
Thomson	0	41	3
Toccoa	0	27	5
Valdosta	0	17	16
Waycross	0	21, 23	17

I D A H O

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Aberdeen	-	43	1
Arco	-	28	0.5
Blackfoot	-	33	4
Boise	2,4,5,7	-	26
Bonners Ferry	-	31,33	1
Buhl	-	44	2
Burley	-	24	5
Caldwell	-	35,37	7
Cascade	-	18	1
Challis	-	26	0.6
Coeur D'Alene	9,12	41,43	10
Council	-	31	0.7
Diggs	-	39	1
Dubois	-	[illegible]	0.3
Gooding	-	[illegible]	3
Grangerville	-	[illegible]	2
Idaho Falls	3,6	[illegible]	15
Kellogg Wardner	-	16	4
Ketchum	-	36	1
Lewiston	-	32,34	11
Mackay	-	38	0.8
Malad City	-	45	3
Montpelier	-	26	3
Moscow	-	21	6
Mountain Home	-	39	1
Nampa	9,12	23,25	12
Orafino	-	36	2
Pocatello	8,10	35	18
Preston	-	15,17	4
St. Anthony	-	41	3
St. Maries	-	18	2
Salmon	-	15	2
Sandpoint	-	20,22	4
Shoshone	-	14	1
Soda Springs	-	37	1
Twin Falls	11,13	16	12
Wallace	-	39	4
Weiser	-	27,29	4

ILLINOIS

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Aurora	0	41,43	47
Bloomington	0	26	33
Cario	0	15	14
Carthage	10	0	3
Centralia	0	24	16
Champaign	0	15	23
Chicago	2,4,5,7,9,11,13	0	3,397
Clinton	0	38	6
Danville	0	19	37
Decatur	0	34,36	59
Elgin	0	20	38
Galesburg	0	21	29
Harrisburg	0	32	11
Herrin	0	[illegible]	9
Jacksonville	0	[illegible]	20
Joliet	0	[illegible]	42
Kankakee	0	[illegible]	22
Kewanee	0	16	17
La Salle	0	33	13
Lincoln	0	44	13
Litchfield	0	29	7
Metropolis	0	22	6
Moline-Rock Island-Dav	4,5	42	175
Mt. Carmel	0	35	7
Mt. Vernon	0	27	15
Peoria	6,12	31	105
Quincy	0	18,30	46
Rockford	0	27,29	85
Springfield	3	17	76
Sterling	0	35	11
Urbana	0	22	14
Vandalia	0	40	5
Waukegan	0	46(c)	34

PROPOSED

I O W A

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Ames	4	-	13
Albia	-	34	5
Algona	10	-	5
Atlantic	-	32	6
Boone	-	25	12
Burlington	-	28	26
Carrol	-	40	5
Cedar Rapids	7,9	-	62
Centerville	-	26	8
Chariton	-	41	6
Charles City	12	-	8
Cherokee	-	38	7
Clarinda	-	23	5
Clinton	-	27	26
Creston	-	21	8
Davenport, Rock Island, Moline	4,5	48	175
DeCorah	3	-	5
Des Moines	8,11,13	-	184
Dubuque	-	45	44
Fairfield	-	24	7
Fort Dodge	-	17	23
Fort Madison	-	14	14
Glenwood	-	28	5
Iowa City	2	-	17
Iowa Falls	-	33	4
Keokuk	-	32	15
Knoxville	-	43	7
Marshalltown	-	15	19
Mason City	-	39	27
Muscatine	-	40	18
Newton	-	29	18
Ottumwa	-	20,38	32
Red Oak	-	42	6
Shenandoah	-	16	7
Sioux City	2,5,9	-	82
Storm Lake	-	35	5
Waterloo-Cedar Falls	-	22,36	67
Webster City	-	19	7

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I N D I A N A

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Anderson	-	27	42
Bedford	-	33	13
Bloomington	10	--	21
Columbus	-	43	12
Evansville	-	16,18,20	97
Fort Wayne	-	25,38	118
Gary	-	48(c)	112
Indianapolis	6,8,12	45	387
Kokomo	-	23	34
LaFayette	-	37	29
Logansport	-	21	20
Marion	-	18	27
Muncie	-	[illegible]	50
Richmond	-	41	35
Seymour	-	[illegible]	9
South Bend	-	40,46	101
Terre Haute	-	28,38	63
Tell City	3	--	5
Vincennes	-	14	18

PROPOSED

K A N S A S

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Anthony	-	39	3
Arkansas City	-	37	13
Atchison	-	18	13
Baxter Springs	-	38	5
Belleville	-	27	3
Clay Center	-	38	5
Coffeyville	-	44	17
Colby	-	26	2
Concordia	-	34	6
Dodge City	-	24,43	8
El Dorado	-	16	10
Emporia	-	21	13
Ft. Scott	-	32	11
Garden City	9,11	-	6
Goodland	-	28	3
Great Bend	5	14	9
Hays	-	22	6
Hutchinson	-	30	30
Iola	-	41	12
Junction City	8	-	9
Kansas City (see Kansas City, Mo.)		-	-
Kinsley	-	41,45	2
Larned	-	30	4
Lawrence	-	39	14
Liberal	-	38	4
Lindsborg	-	42	2
McPherson	-	28	1
Manhatten	-	15	12
Newton	-	31	11
Norton	-	36	3
Oberlin	-	33	2
Osawatomie	-	24	5
Osborne	-	17	2
Ottawa	-	26	10
Phillipsburg	-	44	2
Pittsburg	-	30	18
Pratt	-	18	7
Russell	-	32	5
Salina	-	40	21
Scott City	-	31	2
Sharon Springs	-	21	1
Syracuse	-	29	1
Topeka	11,13	-	68
Wellington	-	33	7
Winfield	-	35	10
Wichita	3,10,12	-	115

KENTUCKY

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Ashland (see West Virginia)			
Bowling Green	-	34	15
Corbin	-	45	8
Danville	-	38	7
Frankfort	-	15	11
Glasgow	-	40	6
Hazard	-	23	7
Henderson	-	41	13
Hopkinsville	-	36	12
Lexington	-	19	49
Louisville	5,9	29,31	434
Madisonville	-	25	8
Mayfield	-	17	9
Maysville	-	39	7
Middlesborough	-	41	12
Murray	-	[illegible]	4
Owensboro	-	[illegible]	30
Paducah	12	-	34
Richmond	-	21	7
Somerset	-	35	6
Winchester	-	42	9
Van Cleve	-	28	.75

LOUISIANA

Abbeville	-	28	7
Alexandria	5,11,13	-	27
Bastrop	-	23	7
Baton Rouge	-	43,45	35
Bogalusa	-	26	15
Crowley	-	18	10
DeRidder	-	29	4
Eunice	-	38	5
Hammond	-	14	6
Houma	-	24	9
Jennings	-	31	7
Lafayette	-	41	19
Lake Charles	-	23	21
Minden	-	14	7
Monroe	-	32,39	28
Natchitoches	-	24	7
New Iberia	-	34	14
New Orleans	2,4,5,7,10	--	540
Oakdale	-	19	4
Opelousas	-	15	9
Pineville	-	21	4
Ruston	-	16	7
Shreveport	3,10,12	--	112
Tallulah	-	30	6
Thibodeux	-	32	6
Winnfield	-	36	5

M A I N E

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Augusta	8,10	19,21,23	19
Bangor-Old Town	5,12	36,42	37
Biddeford-Saco	-	14,16	28
Brunswick	-	44	7
Calais	2,7	14,16,18	5
Ft. Kent-St. Francis	8	15,17,19,21	6
Houlton	-	25,27,29	7
Lewiston-Auburn	-	28,30	58
Portland	6,13	-	106
Presque Isle	-	31,33,35	17
Waterville	-	32,34	16

M A R Y L A N D

Annapolis	-	49(c)	13
Baltimore	2,11,13	11,16	1,047
Cumberland	-	39,44	39
Hagerstown	-	35	33
Salisbury	-	43	13
Frederick	-	37	16

PROPOSED

M A S S A C H U S E T T S

Barnstable-W. Yarmouth	-	37	8
Boston	2,4,5,7	-	771
Brockton	-	48(c)	62
Fall River-New Bedford	-	19,21,23	225
Lawrence-Lowell-Haverhill	-	25,27	232
Pittsfield	-	28	50
Springfield-Holyoke	-	36,38	150
Worcester	-	43,45	194

M I C H I G A N

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Alpena	-	39	13
Ann Arbor	-	37	30
Battle Creek	-	29	43
Benton Harbor	-	44	17
Cadillac	-	23	10
Cheboygan/Mackinaw	4	-	6
Detroit	2,4,7	24,27	2,296
Escanaba	-	25	15
Flint	-	14,16,34	189
Gladstone	13	-	5
Grand Rapids	7,12	33,35	210
Hancock	-	16	6
Harbor Beach	-	[illegible]	2
Holland	-	[illegible]	15
Houghton	-	27	4
Iron Mountain	7,9	32,[illegible]	11
Iron River	-	[illegible]	4
Ironwood	-	30	13
Ishpeming	-	20	9
Jackson	-	20,22	50
Kalamazoo	[illegible]	15	77
Lansing	[illegible]	25	110
Ludington	-	30	9
Manastique	-	15	5
Manistee	-	27	9
Marquette	3,5,10	18	16
Midland	-	28	10
Muskegan	-	17,19	48
Petoskey	-	29,31	6
Pontiac	-	48(c)	67
Port Huron	-	46(c)	33
Rogers City	-	42	3
Saginaw - Bay City	-	18,21,32	153
Sault St. Marie	8,10	14,16	16
Tawas City	-	25	1
Traverse City	-	41,43	14
West Branch	-	36	2
			73

PROPOSED

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M I N N E S O T A

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Albert Lea	0	24	12
Alexandria	0	29	5
Austin	0	16	18
Bemidji	0	22	9
Brainerd	0	43	12
Chisholm	0	44	7
Crookston	0	20	7
Detroit Lakes	0	27	5
Duluth/ Superior (see Wisconsin)			157
Ely	0	18	7
Eveleth	0	37	7
Fairmont	0	26	7
Faribault	0	21	15
Fergus Falls	0	33	11
Grand Rapids	0	36	5
Hastings	0	40	6
Hibbing	0	39,41	16
International Falls	0	14,16	6
Little Falls	0	25	6
Mankato	0	44	16
Marshall	0	20	5
Minneapolis-St. Paul	2,4,5,7,9,11,13	0	911
Montevideo	0	36	5
Moorhead (see Fargo)			
New Ulm	0	28	9
Northfield	0	14	5
Owatonna	0	42	9
Pine City	0	31	2
Red Wing	0	18	10
Rochester	0	32,34	26
St. Cloud	0	17,19	24
Thief River Falls	0	24	6
Virginia	0	21	12
Wadena	0	32	3
Willmar	0	15	8
Winona	0	38	22
Worthington	0	23	6

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M I S S I S S I P P I

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Aberdeen	0	15	5
Biloxi	0	31,33	17
Brookshaven	0	18	6
Canton	0	24	6
Clarksdale	0	29,31	12
Columbia	0	29	6
Columbus	0	25	14
Greenville	0	43,45	21
Greenwood	0	21	15
Grenada	0	17	6
Gulfport	0	21,23	15
Hattiesburg	0	40,42	21
Jackson	3,9,12	6	88
Laurel	0	16	21
Kosciusko	0	19	4
McComb	0	20,23	10
Macon	2	0	2
Meridian	0	36,38	35
Natchez	0	25,27	15
Pascagoula	0	28	6
Philadelphia	0	34	4
Picayune	0	44	5
Starkville	0	28	5
Tupelo	0	22	8
Vicksburg	0	35,37	24
West Point	0	32	6
Yazoo City	0	41	7

PROPOSED

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M I S S O U R I

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Cape Girardeau	-	45	19
Carrollton	-	40	4
Carthage	-	25	11
Chillicothe	-	44	8
Clinton	-	20	6
Columbia	-	15	18
De Sota	2	-	5
Flat River	-	31	65
Fulton	-	33	8
Hannibal	-	25	21
Hermitage	-	23	0.3
Jefferson City	6	43	24
Joplin	-	19,22	37
Kansas City	2,4,5,9	--	399
Lebanon	--	27	5
Lexington	--	31	5
Louisiana	-	39	5
Marshall	-	17	9
Maryville	-	30	6
Mexico	-	22	9
Moberly	-	36	13
Nevada	-	34	8
Popular Bluff	-	21	11
Rolla	-	35	5
St. Joseph	-	35,37	76
St. Louis	4,5,7,9,11,13	--	816
Salem	-	14	3
Sedalia	-	29	20
Sikeston	-	26	8
Springfield	3,10,12	--	61
Van Buren	-	38	0.5
Washington	-	19	7
West Plains	-	41	4

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MONTANA

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Anaconda	-	35,37	11
Baker	-	19	1
Big Timber	-	24	2
Billings	2,4,5,7	19,21	23
Bozeman	-	14,16	9
Broadus	-	29	0.6
Butte	2,4,5,7	33,40	37
Chester	-	30	0.5
Chinook	-	25	2
Chouteau	-	18	1
Circle	-	28	0.7
Cut Bank	-	43,45	3
Dillion	-	27	3
Ekalaka	-	26	0.7
Forsyth	-	38,39	2
Fort Benton	-	36,38	2
Glasgow	-	18,20,22	4
Glendive	-	21	5
Great Falls	3,6,8	26,28	30
Hamilton	-	24	2
Harlowton	-	44	2
Havre	9,11	19,21,23	6
Hardin	2	41,43	2
Helena	10,12	-	15
Hysham	-	37	0.4
Jordan	-	30	0.7
Kalispell	-	15	8
Lewistown	-	17	6
Libby	-	35,37	2
Livingston	-	32,34	7
Malta	-	27	2
Miles City	3,6,10	14,16,24	7
Missoula	11,13	17,19	18
Paradise	-	42	0.35
Philipsburg	-	29	1
Plentywood	-	29,31,44	2
Polson	-	27	2
Red Lodge	-	29	3
Roundup	-	35	3
Saco	-	45	0.5
Scobey	-	41	1
Shelby	-	14,16	3
Sidney	-	15,17	3
Stanford	-	15	1
Thompson Falls	-	25	0.7
Virginia City	-	45	0.4
Whitehall	-	22	1
White Sulphur Springs	-	20	1
Wibaux	-	40	0.6
Winifred	-	41	0.3
Winnett	-	42	0.4
Wolf Point	-	33	2
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NEBRASKA

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Ainsworth	-	38	2
Alliance	-	15,37	6
Atkinson	-	34	1
Bayard	-	42	2
Beatrice	-	45	11
Bridgeport	-	40	2
Broken Bow	-	16	3
Columbus	-	26	8
Crawford	-	22	2
Fairbury	-	43	6
Falls City	-	33	6
Fremont	-	36	12
Gothenburg	-	14	1
Grand Island	-	35,37	19
Hastings	4	10,41	15
Holdrige	-	8	3
Kearney	-	21,23	10
Lexington	-	18	4
Lincoln	10,12	-	82
McCook	8,13	-	6
Nebraska City	-	14	7
Neligh	-	17	2
Norfolk	-	15	10
North Platte	2,5	-	12
Ogallala	-	24	3
Omaha	3,6,7	-	224
O'Neill	-	20	3
Ord	-	30	2
Scottsbluff	-	18,20	12
Seward	-	24	3
Sidney	-	32	3
Stanton	-	22	2
Superior	-	29	3
Valentine	-	28	2
West Point	-	44	3
York	-	19	5

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N E V A D A

	VHF Channel No.	UHF Channel No.	Pop. in Thousands
Austin	-	29	0.5
Battle Mountain	-	42	0.8
Boulder City	-	18,22	3
Caliente	-	28,30,43	1
Carson City	-	30	2
Elko	10	15,17,19	4
Ely	3,6	14,16,20	4
Eureka	-	40	0.6
Fallon	-	35	2
Gerloch	-	28	0.1
Goldfield	-	44	0.6
Henderson	-	27,32	7
Las Vegas	8,10,12	14,16,41,45	8
Lovelock	-	25	1
McDermitt	-	26	0.2
McGill	-	23,25	3
Mina	-	39	0.4
Mountain City	-	34	0.9
Overton	-	34,36	1
Palisade	-	45	0.1
Pioche	-	24,26	1
Reno	3,13	14,16	21
Sparks	-	37	5
Tonopah	-	18,21	2
Wells	-	41	0.8
Winnemucca	-	18,21	2
Yerington	-	23	1

N E W H A M P S H I R E

Berlin	-	26	19
Concord	-	31,33	27
Laconia	-	35	13
Littleton-Bethlehem	-	40	5
Manchester	9	29	81
Portsmouth	-	39,41	14

N E W J E R S E Y

Asbury Park	-	46(c)	15
Atlantic City	-	23,25,27	100
Newark	13	0	430
New Brunswick	-	48(c)	38
Trenton	-	15,17,41	125
Vineland	-	39	8